

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

ECOFACTOR, INC.,

Plaintiff,

v.

GOOGLE LLC,

Defendant.

Case No. 6:20-cv-00075-ADA

JURY TRIAL DEMANDED

ECOFACTOR, INC.,

Plaintiff,

v.

ECOBEE, INC.,

Defendant.

Case No. 6:20-cv-00078-ADA

JURY TRIAL DEMANDED

ECOFACTOR, INC.,

Plaintiff,

v.

VIVINT, INC.,

Defendant.

Case No. 6:20-cv-00080-ADA

JURY TRIAL DEMANDED

DEFENDANTS' OPENING CLAIM CONSTRUCTION BRIEF

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No.	Exhibit
1	Oct. 7, 2010 Office Action from prosecution history of U.S. Patent No. 8,180,492
2	Feb. 7, 2011 Response from prosecution history of U.S. Patent No. 8,180,492
3	Mar. 1, 2012 Response from prosecution history of U.S. Patent No. 8,180,492
4	Aug. 2, 2011 Response from prosecution history of U.S. Patent No. 8,180,492
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Defendants Google LLC, ecobee, Inc., and Vivint, Inc. hereby submit their Opening Claim Construction Brief.

I. Background on Asserted Patents

The four asserted patents generally cover management of HVAC systems. The claimed management features include determining whether someone is home to adjust temperatures, checking if an HVAC system is on or off, and handling requests to reduce energy usage.

A. U.S. Patent No. 8,180,492 (“492 Patent”)

The ’492 patent issued May 15, 2012 from an application filed July 13, 2009. The patent tries to solve the problem of adjusting home temperatures based on occupancy. While motion sensors “involve considerable expense” and “cannot reliably detect presence,” the ’492 patent is directed to detecting occupancy based on user interaction: “detecting the use of networked consumer electronics devices as indications of occupancy.” ’492 at Abstract, 3:1-15. Independent claims 1 (method) and 10 (system) are essentially identical and each recite steps for determining occupancy, prompting the user about changing temperature, and then keeping a non-occupied temperature setpoint in response to input overriding the proposed change in temperature.

B. U.S. Patent No. 8,412,488 (“488 Patent”)

The ’488 patent issued April 2, 2013 from an application filed March 1, 2012, and addresses the problem of checking if an HVAC system is on or off based on outside and inside temperatures. The patent “comprises systems and methods for estimating the rate of change in temperature inside a structure,” in connection with “a system for offering peak demand reduction to electric utilities.” ’488 at Abstract, 1:22-25. The ’488 patent purports to use the “relationship between the inside temperature and the outside temperature to determine whether the climate control system is ‘on’ or ‘off.’” *Id.* at Abstract. The ’488 patent specification discloses embodiments in which temperature measurements and calculations based on temperature data over

time are used to assess whether the operating status of the HVAC system in a structure is “on” or “off.” *Id.* at 3:25-4:15. Independent claims 1 and 9 of the ’488 patent are directed to a system and method for “monitoring the operation[al status] of an HVAC system,” comprising: (1) an HVAC control system associated with a first structure; and (2) one or more processors that are capable of: (i) receiving measurements of outside temperatures from a source other than the HVAC system; (ii) comparing a received inside temperature and the outside temperature; (iii) deriving an estimation for the rate of change in inside temperature of the structure in response to outside temperature; and (iv) comparing an inside temperature with the estimation for the rate of change in inside temperature to “determine whether the first HVAC system is on or off.”

C. U.S. Patent No. 8,738,327 (“327 Patent”)

The ’327 patent issued May 27, 2014 from an application filed March 28, 2013, and is related to the ’488 patent. The ’327 patent purports to relate to “systems and methods for estimating the rate of change in temperature inside a structure.” ’327 at Abstract. The ’327 Abstract states that, “[a]t least one thermostat located is [sic] inside the structure and is used to control an [sic] climate control system,” a “remote processor is in communication with said thermostat,” and “at least one processor compares the outside temperature” with “information reported . . . from the thermostat” in order to “determine whether the climate control system is ‘on’ or ‘off.’” *Id.* The ’327 patent explains that the “invention relates to the use of thermostatic HVAC controls . . . connected to a computer network as a part of a system for offering peak demand reduction to electric utilities.” *Id.* at 1:22-25. Independent claims 1 and 11 of the ’327 patent are directed to a system and method for controlling the operation of an HVAC system requiring: (1) a thermostat inside the structure, and (2) one or more remote servers. The remote servers are capable of: (i) receiving measurements of outside temperatures; (ii) communication with the thermostat; (iii) receiving inside temperatures from the thermostat; (iv) comparing the inside and outside

temperatures to “derive an estimation for the rate of change in inside temperature of the structure in response to outside temperature”; (v) receiving a demand reduction request; and (vi) sending a signal to the thermostat to change the first setting to a second setting to reduce demand by the HVAC system.

D. U.S. Patent No. 10,534,382 (“382 Patent”)

The ’382 patent issued January 14, 2020 from an application filed April 3, 2019. The patent purports to be directed to “systems and method for detecting the use of networked consumer electronics as indications of occupancy” for purposes of “automatically adjusting the temperature setpoint.” ’382 at Abstract. The ’382 patent states that the “state of occupancy is used to alter the setpoint on the thermostatic HVAC control to reduce unneeded conditioning of occupied spaces.” *Id.* Independent claims 1 and 17 are directed to systems for controlling an HVAC system at a user’s building that comprise, among other things, a set of processors that (i) receive first data including a measurement of at least one characteristic of the building, (ii) receive second data from a network connection, (iii) receive temperature setpoints corresponding to a desired temperature setting when the building is occupied or unoccupied, and (iv) execute instructions to determine whether the building is occupied or unoccupied, and based on that determination, control the HVAC system.

II. Disputed Constructions

A. “rate of change in inside temperature” (’488 patent claims 1, 9; ’327 patent claims 1, 11); “rate of change in temperature inside the [said] structure” (’488 patent claims 8, 16; ’327 patent claims 5, 15)

Plaintiff’s Proposal	Defendants’ Proposal
“the difference between two inside temperature measurements over a particular span of time between the measurements”	“the difference between inside temperature measurements divided by the span of time between the measurements (<i>i.e.</i> , $\Delta T/\Delta t$)”

The claims of both the ’488 and ’327 patents require a set of processors (or servers) that are

configured to derive an estimate for the “rate of change in inside temperature” of a structure. *See* ’488 at cl. 1, 9; ’327 at cl. 1, 11. Defendants propose that this term be construed to mean “the difference between inside temperature measurements divided by the span of time between the measurements (*i.e.*, $\Delta T/\Delta t$).” This construction is consistent with the intrinsic and extrinsic evidence, as discussed below.

The term “rate of change” is well-understood to be “a value that results from dividing the change in a function of a variable by the change in the variable.” *See* Ex. 6¹ (Merriam-Webster, 10th ed. (1999), at 969); *see also* Ex. 11 (<https://www.merriam-webster.com/dictionary/rate%20of%20change> (showing current definition unchanged from 1999)). In the ’488 and ’327 patents, the rate of change is for temperature, which is expressed, for example, as degrees Fahrenheit per second, degrees Celsius per hour, or the like. More generically, if the temperature T is a function of time t, then the “rate of change” of the temperature is, in mathematical terms, represented as “ $\Delta T/\Delta t$,” where ΔT refers to the difference in temperature and Δt is the span in time between those two measurements. The construction proposed by Defendants accurately reflects this well-understood meaning of a “rate of change.”

Furthermore, in the context of the claim language—which requires a rate of change *in inside temperature*—the claimed “rate of change” relates to the difference between two inside temperature measurements divided by the span of time between those inside temperature measurements. For example, if the inside temperature measurement at 1pm is 70 degrees Fahrenheit and the inside temperature measurement at 2pm is 80 degrees Fahrenheit, the rate of change in inside temperature is 10 degrees Fahrenheit per hour (or $10^{\circ}\text{F}/1\text{hr}$). This is consistent with the common specification of the ’488 and ’327 patents, which uses the term “rate” in the

¹ “Exs. 1-13” refer to exhibits to the Declaration of Bijal Vakil, filed concurrently.

context of the rate at which inside temperature measurement changes. The '488 and '327 patents explain that “basic versions of thermostats use components such as a coiled bi-metallic spring to measure actual temperature” while “electronic digital thermostats . . . use solid-state devices such as thermistors or thermal diodes to measure temperature.” '488 at 1:36-46; '327 at 1:36-46. The patents then explain that the “invention comprises systems and methods for estimating the *rate of change in temperature inside a structure.*” '488 at Abstract; '327 at Abstract (emphases added). For instance, in reference to Figure 6a, the patents explain that “[w]hen the air conditioning turns on, *the inside temperature stays constant (or rises at a much lower rate)* despite the rising outside temperature.” '488 at 7:8-9; '327 at 7:8-9 (emphases added). Similarly, in reference to Figure 8, the patents further explain that “[i]f the server determines that *the temperature inside the house is rising at the rate* predicted if the air conditioning is shut off, then the server confirms 508 that the air conditioning has been shut off.” '488 at 7:57-60; '327 at 7:57-60 (emphases added).

EcoFactor agrees that “a rate of change in inside temperature” must consider the difference between two inside temperature measurements. But the rest of EcoFactor’s proposed construction is flawed for two reasons. *First*, by generically referring to a “difference . . . over a particular span of time,” EcoFactor’s proposed construction wrongly allows for a calculation that simply takes the difference between two temperature measurements at two different times. This overlooks a matter of elementary mathematics—a rate of change in mathematics is the difference of two measurements *divided by* the difference in time between those measurements. In other words,

$$\text{Rate of Change for A} = \frac{A_2 - A_1}{t_2 - t_1}$$

where ‘A’ equals the measured quantity and ‘t’ equals time.” Applying this mathematical principle to a rate of change in inside temperature, the formula would read:

$$\text{Rate of Change in Temperature} = \frac{\text{Temp}_2 - \text{Temp}_1}{\text{Time of Temp}_2 - \text{Time of Temp}_1}$$

In mathematics, this formula may be represented as “ $\Delta T/\Delta t$,” as explained above and proposed in Defendants’ proposed construction.

EcoFactor seeks to avoid this elementary mathematical principle and leave open the possibility—which it has pursued in related litigations involving related patents—that merely determining a difference between two temperature measurements at two different times is a rate of change in temperature. EcoFactor’s formulation would yield a value with units of temperature, which is not a rate of change. A rate of change in temperature must be expressed as units of temperature *per unit of time*—in other words, $\Delta T/\Delta t$.

Second, by using the phrase “over *a* particular time” instead of “over *the* particular time,” EcoFactor’s proposed construction also incorrectly suggests that the span of time used for calculating the rate of change can somehow be different than the actual span of time between the two inside temperature measurements. As discussed above, in order to actually calculate a rate of change in inside temperature, the difference in inside temperature measurements must be divided by the actual span of time between those temperature measurements.²

Accordingly, Defendants respectfully request that the Court adopt their construction and construe “rate of change in inside temperature” to mean “the difference between inside temperature measurements divided by the span of time between the measurements (*i.e.*, $\Delta T/\Delta t$).”

² Additionally, the claims lack an antecedent basis for “*the* rate of change,” and are indefinite in that respect.

B. “measurement[s]” [“measurement[s]”; “measurement of outside temperatures”; “temperature measurement inside a structure”; “temperature measurements from inside the structure”; “measurement of at least one characteristic of the building”; “measurement of the current outdoor temperature”] (’488, ’327, and ’382 patents, all claims)

Plaintiff’s Proposal	Defendants’ Proposal
Plain and ordinary meaning; no construction necessary.	“determination [of the claimed property] by an instrument by using standardized units”

“Measurement” is a well-understood scientific term that should be defined for the jury. “[T]he process or the act of the measurement consists of obtaining a quantitative comparison between a predefined *standard* and a *measurand*.” *See* Ex. 5 (Thomas G. Beckwith & Roy D. Marangoni, Mechanical Measurements (4th Ed.) (“Mechanical Measurements”) at 1 (emphasis in original)). The claims use the term “measurement” in precisely this manner, to reflect determination of temperature with an instrument. The asserted claims all use the term “measurement” with respect to temperatures: “receives temperature measurements from inside the structure,” “receiving temperature measurements inside a structure from at least one thermostat,” “measurement of at least one characteristic of the building,” “measurement of the current temperature of the building by the sensor,” and “receive measurements of outside temperatures.” ’327 at 9:30, 10:16-19; ’382 at 8:20-21, 9:14-15; ’488 at 9:47.

The specification also makes clear that measurements are accomplished by instruments, such as sensors. *See, e.g.*, ’488 at 1:37-38; ’327 at 1:37-38; ’382 at 1:37-38 (“[T]hermostats use components such as a coiled bi-metallic spring to measure actual temperature,”); ’488 at 6:63-65; ’327 at 6:63-65 (“the bi-directional communication will also allow the thermostat to regularly measure and send to the server information about the temperature in the building.”); ’488 at 9:11-13 (“The system installed in a subscriber’s home may optionally include additional **temperature sensors** at different locations within the building.”) (emphasis added); *id.* at 9:15-18 (“Additional

temperature and/or humidity sensors may allow increased accuracy of the system, which can in turn increase user comfort, energy savings or both.”).

The specification does not provide for the term “measurement” to mean a forecast. EcoFactor has asked the Court to give the term “measurement” its “plain and ordinary meaning,” but in both its infringement contentions in these cases and in related litigations involving related patents, EcoFactor has attempted to include forecasted temperatures as falling within the ambit of the meaning of the term “measurement.” They do not. Because there is an actual dispute between the parties as to what constitutes a “measurement,” construction of this term is necessary to determine the proper scope of the claims. *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1360 (Fed. Cir. 2008) (“When the parties raise an actual dispute regarding the proper scope of these claims, the court, not the jury, must resolve that dispute.) The term “measurement” should be given its meaning in the context of the claims—a “determination [of the claimed property] by an instrument by using standardized units.”

C. '488 Patent Claims 1 and 9 – Indefiniteness

Plaintiff's Proposal	Defendants' Proposal
Plain and ordinary meaning; no construction necessary.	Indefinite due to lack of essential structural connections, under <i>In re Collier</i> , 397 F.2d 1003 (C.C.P.A. 1968), and its progeny.

The asserted claims of the '488 patent are invalid as indefinite because they list multiple components without reciting structural relationships between them. Claims 1 and 9 recite systems with two sets of components—“at least one HVAC control system” and “one or more processors.” However, the claims do not identify any structural relationship between any of those parts, and thus fail to inform the public about the scope of the claims with reasonable certainty.

Under long-standing law, claims are indefinite if they fail to identify essential structural connections. *See In re Collier*, 397 F.2d 1003, 1005 (C.C.P.A. 1968) (affirming rejection of claim

that “does not positively recite structural relationships of the two elements”). “Patents claiming a system, are indefinite under § 112 if the claim does not recite structural relationships of essential elements.” *Acacia Media Techs. Corp. v. New Destiny Internet Grp.*, 405 F. Supp. 2d 1127, 1138 (N.D. Cal. 2005). For example, a “sequence encoder” in a communication system was indefinite where the claim “omits disclosure of a cooperative relationship with the other elements” and there was “no specification of its input or its output.” *Id.* at 1138.

The claims here are similarly deficient. Independent claims 1 and 9 are indefinite because they merely recite a catalog of elements, and fail to specify any structural relationship between the claimed components of the “HVAC control system” and the “one or more processors.” *See Declaration of Don Turnbull (“Turnbull Decl.”) ¶ 46-53.* Claims 1 and 9 recite functions associated with the HVAC control system (receiving temperature measurements) and the one or more processors (receiving measurements of outside temperatures, etc.), but they recite no structural relationship whatsoever. None of these functions provides insight into any structural relationship between the components. At most, the only overlap as to the functionality of the HVAC control system and the one or more processors is that both perform functions involving inside temperature measurements. However, the claims fail to recite which component provides these inside temperature measurements to the other component, or whether the HVAC control system, the one or more processors, or both receive the inside temperature measurements from some other component, or whether another configuration exists. *Id.* ¶ 47.

The specification also fails to clarify the structural relationship between these components. Because there is no disclosure of an HVAC control system, it is not possible to infer from the specification any structural relationship between the HVAC control system and the one or more processors. For example, Figure 2 of the ’488 patent shows “in further detail” the “major

elements” of the system, including computer 104, thermostat 108, HVAC unit 110, a server containing a database 106a and 106b, and a gateway 110, that connects the thermostat and computer to the Internet 102. ’488 at 5:47-67. But absent from this disclosure is any description of the identified “major element[s]” of the system.

Further complicating the disclosures, all of the “major elements” of the system (apart from the HVAC system 110) are disclosed as comprising one or more processors, including computer 104, server 106, and thermostat 108. *See* Turnbull Decl. ¶¶ 35-38, 49. Accordingly, a PHOSITA cannot infer from the specification any structural relationship regarding the one or more processors. The specification also teaches that “control of the HVAC system [] relies primarily on communication running from the *server* to the thermostat” (’488 at 6:61-62) and that “the system will be capable of numerous diagnostic and controlling functions **beyond** those of a standard thermostat” (*id.* at 6:67-7:2). *See* Turnbull Decl. ¶¶ 39-42, 50. The claims thus create many possible arrangements of these components, but no way to identify which infringe. *See id.* ¶¶ 51-52.

A person of ordinary skill in the art would understand that the HVAC control system and HVAC system are separate and distinct components because claims 1 and 9 refer to them separately. *See id.* ¶ 50. Thus, the ’488 patent introduces more ambiguity about whether the HVAC control system corresponds to any component of the system and how it might interact with any other component. The same is true for “one or more processors,” which could correspond to any of the “major elements” or combination of elements in the system. *Id.* ¶ 35-38, 49.

D. “user interface actions intended to alter a state of one or more of said [networked] electronic devices” (’492 patent claims 1, 10)

Plaintiff’s Proposal	Defendants’ Proposal
Plain and ordinary meaning; no construction necessary.	“a user intentionally interacting with the device’s graphic user interface to alter the device’s state and indicate whether the structure is occupied”

The disputed phrase appears in the following limitations of claims 1 and 10:

From claim 1: “determining whether one or more networked electronic devices inside said structure are in use, wherein said networked electronic devices comprise a graphic user interface comprising a display, wherein said networked electronic devices receive input from one or more users and wherein use of said networked electronic devices comprises at least one of cursor movement, keystrokes or other *user interface actions intended to alter a state of one or more of said networked electronic devices by one or more users*;”

From claim 10: “one or more electronic devices having at least a graphic user interface comprising a display wherein said electronic devices receive input from one or more users and wherein use of said electronic devices comprises at least one of cursor movement, keystrokes or other *user interface actions intended to alter a state of one or more of said electronic devices* by one or more users wherein activity of one or more networked electronic devices indicates whether said thermostat should be changed from said first temperature setpoint to said second temperature setpoint;”

Defendants’ construction clarifies for a jury that a user intentionally interacts with the claimed graphic(al) user interfaces of the electronic devices, and that those actions also indicate whether a structure is occupied. This proposal explains that the invention looks for user interaction with devices to see if the user might be home, so that it can ask the user about adjusting the temperature.

First, the language and ordering of the claims themselves support this construction. The independent claims each require determining whether networked electronic devices are “in use,” where the “use” comprises “at least one of cursor movement, keystrokes or *other* user interface actions *intended* to alter a state.” *E.g.*, ’492 cl. 1 (emphasis added). Accordingly, the claims

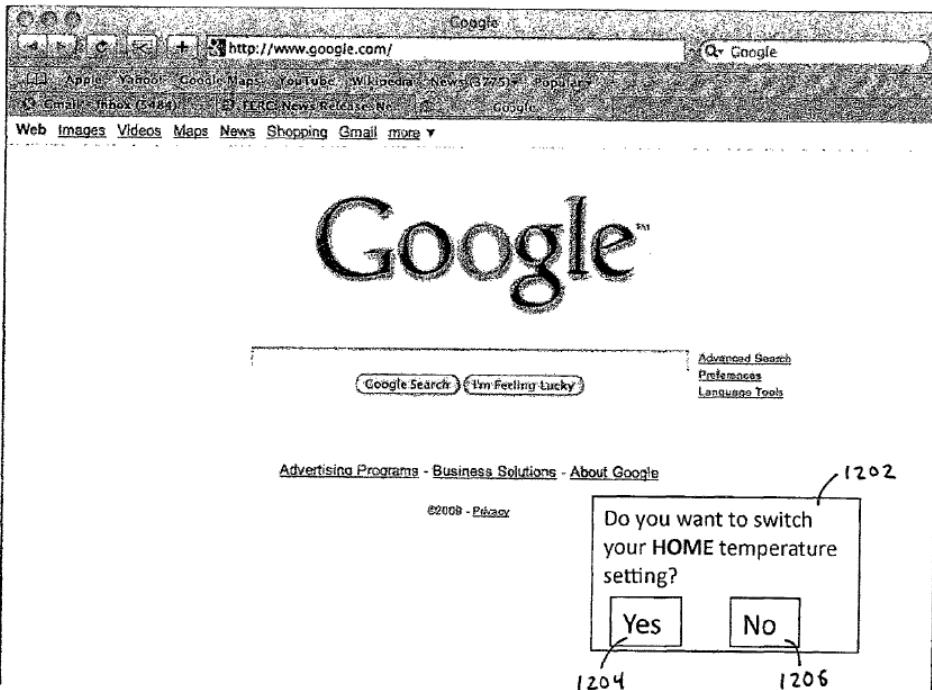
explain that “user interface actions” are intentional—“intended to alter a state”—and that cursor movement and keystrokes are examples of such actions. Furthermore, the altered “state” relates to occupancy of the structure because, “in response to use” of the claimed devices, the system determines that the HVAC system is set to a temperature setpoint “indicating that said structure is deemed to be non occupied.” *Id.* The claims further specify that the “networked electronic devices comprise a graphic user interface comprising a display” (claim 1), or “electronic devices having at least a graphic user interface comprising a display” (claim 10). Therefore, the claimed electronic devices each have a graphic user interface with a display, through which the system can detect “user interface actions.” If the user did not interact through the “graphic user interface[s],” those recited interfaces would be meaningless. *See Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) (“A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.”).

Second, the specification also supports this construction because the disclosed embodiments all involve users intentionally interacting with a graphic user interface. For example, Figure 1 depicts computers for user interaction, which can be “conventional computers,” “handheld and wireless devices such as personal digital assistants (PDAs), cellular telephones and other devices capable of accessing the network,” or “microprocessor-controlled home entertainment equipment including advanced televisions, televisions paired with home entertainment/media centers, and wireless remote controls.” ’492 at 4:61-5:7. The computers also “utilize a browser” and “provide information, sound, graphics and text.” *Id.* at 5:8-24. These examples are all consistent with home occupants using a device’s graphic user interface, and the system detecting that use for occupancy information.

In another example, Figure 6 “represents the screen of a computer or other device **104** using

a graphical user interface connected to the Internet”:

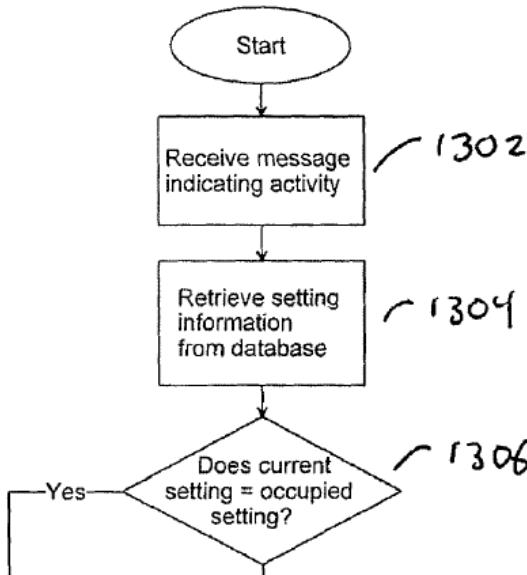
Fig 6



Id. at 6:33-34, Fig. 6. “The screen shows that a browser 1200 is displayed on computer 104. In one embodiment, a background application installed on computer 104 detects activity by a user of the computer, such as cursor movement, keystrokes or otherwise, and signals the application running on server 106 that activity has been detected.” *Id.* at 6:35-40. Figure 7 further confirms that the system detects an intentional action on the graphic user interface of a computer to determine occupancy.³ Figure 7 depicts “a flowchart showing the steps involved in the operation of one embodiment of the subject invention”:

³ In their August 2, 2011 response during prosecution, the applicants stated that they consider Figure 7 to embody the claims: “Applicant has amended the pending claims to more clearly focus on aspects of the embodiments shown in Figure 7” Ex. 4 at 6.

Fig 7



Id. at 6:52-53, Fig. 7 (excerpt). “In step 1302, **computer 104** transmits a message to server 106 via the Internet *indicating that there is user activity on computer 104.*” *Id.* at 6:52:57 (emphases added). Therefore, all of these descriptions require intentional interactions with a computer. By contrast, the specification expressly distinguishes motion sensors (passive sensors without a graphic user interface), warning that they “involve considerable expense” and “cannot reliably detect presence” in a home. *Id.* at 2:61-3:21. The ’492 patent describes and enables only interactions through a graphical user interface. *See Wang Labs., Inc. v. Am. Online, Inc.*, 197 F.3d 1377, 1382 (Fed. Cir. 1999) (construing “frame” based on “[t]he only system that is described and enabled in the ’669 specification and drawings”).

Third, the prosecution history also confirms that the applicants considered “user interface actions” to be intentional interactions with the graphic user interface that alter the device’s state to indicate whether the structure is occupied. As noted above, the issued claims rely on “use” to indicate whether the structure is “occupied” or “non occupied.” ’492 cl. 1. In an October 7, 2010 Office Action, the Examiner rejected the pending claims as anticipated by Williams (U.S. Patent

No. 5,977,964). *See* Ex. 1 at 2 (mis-identified as “5,977,864”). Specifically, the Examiner found that Williams discloses “determining whether one or more networked electronic devices inside a structure are in use.” *Id.* In their following Examiner interview and February 7, 2011 response, the applicants contended that “Williams does not 1) monitor usage of a networked electronic device to determine non-occupancy.” *See* Ex. 2 at 7. Meanwhile, they amended claim 1 to add the entire disputed limitation:

wherein said networked electronic devices **comprise a graphic user interface comprising a display**, wherein said networked electronic devices receive input from one or more users and wherein use of said networked electronic devices comprises at least one of cursor movement, keystrokes **or other user interface actions intended to alter a state** of one or more of said networked electronic devices by one or more users

Id. at 2 (emphases added). The applicants also amended claim 10 to include these features. *See id.* at 3. Thus, in response to the rejection, the applicants narrowed the claims to require each device to have a graphic user interface with a display, while arguing that Williams did not disclose user interactions with a graphic user interface to determine non-occupancy. That is precisely what Defendants’ construction clarifies.

Fourth, the extrinsic evidence also confirms that a PHOSITA would understand “user interface actions” to be intentional interactions. A “user interface” is understood to be “software that is designed to allow a computer user to interact with the operating system of a machine or system (such as by selecting presented options or entering text commands).” Ex. 12 (*User interface*, MERRIAM-WEBSTER.COM, <https://www.merriam-webster.com/dictionary/user%20interface> (last visited Oct. 1, 2020)). The intrinsic and extrinsic evidence agree that a user interface is provided for a “user to interact,” as Defendants’ construction clarifies. In fact, the two examples of user interface actions provided by claim 1 of the ’492 patent (“cursor movement” and “keystrokes”) mirror the two dictionary examples above (“selecting presented options or entering

text commands”). The extrinsic evidence also confirms that by reciting that the “networked electronic devices comprise a graphic user interface comprising a display,” claim 1 requires that the “user interface actions” are a “a user intentionally interacting *with the device’s graphic user interface.*” A PHOSITA would understand a “graphical user interface” to be “[a]n interface for issuing commands to a computer utilizing a pointing device, such as a mouse, that manipulates and activates graphical images on a monitor.” Ex. 9 (*Graphical user interface*, WEBSTER’S II NEW COLLEGE DICTIONARY (2001)). A PHOSITA would understand that the electronic device’s graphical user interface is the interface that the user interacts with.

By contrast, EcoFactor’s proposal of “plain and ordinary meaning” is not helpful to a lay jury because it does not explain the scope of “user interface actions” or the meaning of “intended to alter a state.” EcoFactor’s infringement contentions indicate that “use” includes information from “activity sensors,” which are simply passive motion sensors, but the specification expressly distinguishes such motion sensors from the invention, as noted above. Because the parties present a clear dispute as to claim scope, the Court should construe the term. *See O2 Micro*, 521 F.3d at 1361.

E. “receiving [receives] input from one or more users” (’492 patent claims 1, 10); “said input from said one or more users” (’492 patent claims 1, 9, 10, 18)

Plaintiff’s Proposal	Defendants’ Proposal
Plain and ordinary meaning; no construction necessary.	“a user inputting a response to a prompt on the graphic user interface [display] of the one or more networked electronic devices”

The disputed phrases appear in the following limitations of claims 1, 9, 10, and 18:

From claim 1: “in response to said prompting, *receiving input from said one or more users* to keep said first HVAC temperature setpoint . . . keeping said first HVAC temperature setpoint based upon *said input from said one or more users.*”

From claim 9: “The method of claim 1 in which said first HVAC temperature setpoint is varied automatically based on *said input from said one or more users.*”

From claim 10: “wherein said application in response to said prompting, *receives input from said one or more users* to keep said first HVAC temperature setpoint . . . wherein said thermostat is kept at said first temperature setpoint based upon *said input from said one or more users.*”

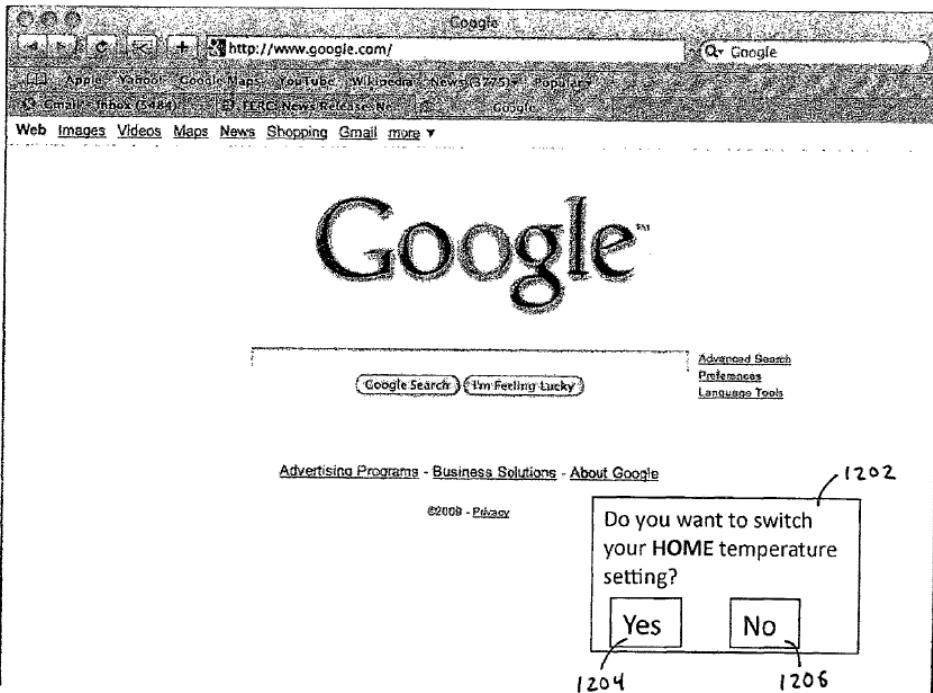
From claim 18: “The system of claim 10 in which said first temperature setpoint is varied automatically based on *said input from said one or more users.*”

The '492 patent requires user input to decide whether to keep the temperature setpoint the same. Defendants' construction explains this function to the jury and ties it to the claimed features of a graphic(al) user interface.

As shown above for the “user interface actions . . .” term, the claim language itself supports Defendants' construction. Claims 1 and 10 recite networked electronic devices with a “graphic user interface comprising a display.” All claims require “prompting said one or more users . . . that said one or more of said user's input should be obtained.” Claim 10 also specifies that the application “provides electronic notice” to the user. “[I]n response to said prompting,” the system “receiv[es] input from said one or more users” to keep the current temperature setpoint, and then “based upon said input” does subsequently keep the current temperature setpoint. Claims 9 and 18 also use the same antecedent basis in “said input” to refer to specific input received in response to said prompting. Accordingly, the components and steps in the claims show that user “input” responds to a prompt on the graphic user interface of the electronic devices.

In the specification, the applicants disclose using the graphical user interface on household devices to receive user input in response to a prompt. As noted above, Figure 6—the sole figure of an onscreen example of the claimed prompting and input—shows a computer screen displaying a pop-up to the user:

Fig 6



The specification explains that in this embodiment, a server “signal[s] the background application running on computer 104 to trigger a software routine that *instantiates a pop-up window 1202* that asks the user if the server should change the current setpoint, alter the overall programming of the system based upon a new occupancy pattern, etc. The user can respond by *clicking the cursor on ‘yes’ button 1204 or ‘No’ button 1206.*” '492 at 6:40-49 (emphases added). Similarly, in describing the flowchart in Figure 7, the specification states that “the application transmits a command to computer 104 directing the browser to display a message informing the user that the current setting assumes an unoccupied house and asking the user in step 1312 to choose whether to either keep the current settings or revert to the pre-selected setting for an occupied home.” *Id.* at 7:6-15. These disclosures show that all embodiments in the specification involve a user inputting a response to a prompt on a graphic user interface of a networked electronic device, such as computer 104. *See Wang*, 197 F.3d at 1382 (construing claims based on embodiments). Meanwhile, the specification distinguished passive motion sensors, which do not involve user

input. *See* '492 at 2:61-3:21.

During prosecution, the applicants amended the claims to specify that the networked electronic devices (which must have a graphical user interface with a display) both prompt the user and receive input. In a March 1, 2012 response, the applicants amended claim 1 to clarify that “said prompting sends a message to at least one of said networked electronic devices.” Ex. 3 at 2 (underlining in original). They also added the limitation of “in response to said prompting, receiving input,” and the requirement of keeping the temperature setpoint based upon “said input,” not merely any kind of “user response to said electronic notice.” *Id.*; *see also id.* at 3 (showing same amendments to claim 10). The applicants then argued that cited prior art did not teach “allowing the user to **override the change** by retaining the non-occupied setting.” *Id.* at 12 (emphasis added). This matches the pop-up example in Figure 6, which offers the user a binary “Yes/No” choice to override the temperature change, and further supports Defendants’ position.

The extrinsic evidence also confirms that a PHOSITA would understand that the “receiv[ed] input from said one or more users” “in response to said prompting” is on the graphic user interface [display] of the one or more networked electronic devices. A “user interface,” such as a graphical user interface, is “software that is designed to allow a computer user to interact with the operating system of a machine or system (such as by selecting presented options or entering text commands).” Ex. 12 (*User interface*, MERRIAM-WEBSTER.COM, <https://www.merriam-webster.com/dictionary/user%20interface> (last visited Oct. 1, 2020)). The intrinsic evidence’s disclosure of the user input as “the user *select[ing]* to retain the current setting” (*see* '492 at 7:14, 7:16-17 (“the user *elects* to change the setting”), FIG. 6) agrees with the extrinsic evidence’s disclosure of a user interface as allowing a user to “*select[]* presented options.” *Id.* (emphasis added). The intrinsic and extrinsic evidence agree that user interfaces—such as graphical user

interfaces—allow users to make selections of presented options.

Plaintiff’s reliance on “plain and ordinary meaning” does not aid a jury to understand how user “input” relates to the hardware components and prompting feature in the claims. On the other hand, Defendants’ construction matches the intrinsic evidence and clarifies that a user “input[s]” a response to a prompt on the graphic user interface of the networked electronic devices, and helps a jury understand how the devices, interfaces, and prompting work together.

F. “outside temperature” ('488 patent claims 1, 2, 9, 10; '327 patent claims 1, 2, 11, 12)

Plaintiff’s Proposal	Defendants’ Proposal
“the temperature at a location outside (or external to) [the structure]”	“the actual temperature at a location outside (or external to) [the structure]”

The parties agree that the term “outside temperature” in the claims of both the '488 and '327 patents refers to the temperature at a location outside, or external to, the structure. The only dispute is whether the “outside temperature” must be the actual outside temperature, as Defendants propose, or whether it can be a temperature that is not the actual outside temperature, as EcoFactor contends. The specifications of the '488 and '327 patents support Defendants’ construction.

The '488 and '327 patents teach that the disclosed system measures temperature directly outside a building: “The outside temperature near house A is 96 degrees Fahrenheit.” '488 at 8:6-7; '327 at 8:6-7. The '488 and '327 patents explain that “[b]y comparing outside temperature, inside temperature, thermostat settings, cycling behavior of the HVAC system, and other variables, the system will be capable of numerous diagnostic and controlling functions beyond those of a standard thermostat.”'488 at 6:65-7:2; '327 at 6:65-7:2. For instance, the patents explain that “if the air conditioning is shut off on a hot afternoon, given *a known outside temperature*, it will be possible to predict how quickly the temperature in the house should rise.”'488 at 4:6-10; '327 at 4:6-10. The patents then further explain that the ability for the system to “*confirm with a high*

degree of certainty” that a climate control system “has indeed been shut off” is “[*b*]*because the server is aware of the outside temperature.*” ’488 at 8:12-21; ’327 at 8:12-21. Thus, the ’488 and ’327 patents make clear that the “outside temperature” is the actual, known, temperature outside the structure.

While similar, the main difference is that EcoFactor’s construction does not clarify that the temperature is the actual measurement outside a structure, as the patents do. Accordingly, Defendants respectfully request that the Court adopt their proposed construction and construe “outside temperature” to mean the “the actual temperature at a location outside (or external to) [the structure].”

G. “programmable thermostat” (’327 patent claims 3, 13)

Plaintiff’s Proposal	Defendants’ Proposal
“thermostat that uses microprocessor-based circuitry to control the switch and operate based upon user determined protocols for temperature vs. time”	“thermostat that uses microprocessor-based circuitry to control the switch and to store and operate based upon user determined protocols for temperature vs. time”

The only dispute is whether the thermostat that operates based upon user-determined protocols for temperature vs. time must also “store” those protocols as proposed by Defendants. The specification describes modern “electronic digital thermostats” as “thermostats [that] use solid-state devices such as thermistors or thermal diodes to measure temperature, and microprocessor-based circuitry to control the switch and to store and operate based upon user-determined protocols for temperature vs. time.” ’327 at 1:40-44 (emphasis added). The specification then equates that definition with “programmable thermostats”: “[t]hese programmable thermostats generally offer . . .” *Id.* at 1:47.

Thus, the patentee acknowledged that the “programmable thermostats” are thermostats that are, in part, capable of storing protocols. This makes sense because a programmable thermostat

would need to “store” its programming in order to operate. Defendants’ proposed construction is consistent with the meaning of programmable as well as the claim language and the intrinsic evidence.

III. Agreed Constructions

The parties agree to the following constructions:

Term	Claims	Agreed Construction
“setpoint”	’492 patent claims 1, 8-10, 17, 18	“a temperature setting for a thermostat to achieve or maintain”
“compare(s)”	’488 patent claims 1, 9; ’327 patent claims 1, 11	“analyze to determine one or more similarities or differences between”
“measurement of the current outdoor temperature”	’382 patent claim 5	“measurement of the outdoor temperature at the present time”

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Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on October 6, 2020, the foregoing was served on all counsel of record by ECF.

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